

Anaphora resolution in L1 and L2 European Portuguese: Does animacy matter?

Over the past decades, a large body of research on anaphora resolution in L1 and L2 Romance null subject languages (NSL), focusing mostly on the syntax-discourse conditions which govern the interpretation of overt and null pronominal subjects, has shown that (i) in native grammars, null subjects tend to be assigned to the antecedent in Spec, IP, which is usually interpreted as topic, while overt subject pronouns are typically assigned to a non-subject antecedent, either the object or an extra-linguistic referent (Carminati, 2002); and (ii) in non-native grammars, an asymmetry emerges between overt and null pronominal subjects in both L1 NNSL (non-NSL) – L2 NSL and L1 NSL – L2 NSL pairings: whereas null subjects tend to be interpreted nativelike, L2 speakers tend to interpret overt pronominal subjects as coreferential with a subject antecedent, even at near-native level (Lozano, 2003; Sorace, 2016; Sorace & Filiaci, 2006). The latter results have been interpreted as evidence in favour of the Interface Hypothesis (IH) (Sorace, 2011; Sorace & Filiaci, 2006), according to which properties at the interface between syntax and external domains such as discourse and pragmatics are a locus of permanent optionality in an L2, in contrast with narrowly syntactic properties or those which involve grammar-internal interfaces (e.g., syntax-semantics), which are generally unproblematic. Note, however, that the IH has not been supported by all L2 studies on anaphora resolution. Rothman (2009), for example, found no problems in the resolution of pronominal subjects by English learners of Spanish at an advanced level.

In addition to the syntax-discourse factors usually considered in L1 and L2 research, semantic factors such as animacy may play a role in anaphora resolution (Cardinaletti & Starke, 1999). Although not much research has addressed the role of animacy in this domain, a few studies have suggested that, in languages such as European Portuguese (EP), overt subject pronouns (but not null subjects) may be sensitive to the animacy of a potential antecedent (Barbosa, Duarte, & Kato, 2005; Morgado, Luegi, & Lobo, 2018). For example, Morgado et al. (2018) have shown that, in the presence of a potential antecedent in object position, native speakers tend to interpret the overt pronoun as coreferential with the object when this is animate; however, this preference is lost when the object is inanimate. As studies on anaphora resolution in L2 grammars have as a rule considered contexts in which all potential antecedents are animate (e.g., Sorace & Filiaci, 2006), the question of whether L2 speakers are sensitive to semantic factors such as the animacy of the antecedent has remained largely unexplored in previous research.

With a view to advancing the current understanding of anaphora resolution in L1 and L2 Romance NSL (EP), we conducted a study into the interpretation of overt and null subject pronouns in intrasentential contexts, considering the effect of animacy in antecedent assignment. The following research questions were formulated: (i) Is the overt subject pronoun sensitive to the animacy features of the antecedent in object position in L1 EP?; (ii) In anaphora resolution, do L1 NSL – L2 EP learners behave like L1 EP speakers regarding a semantic factor like antecedent animacy at developmental stages and at the best attainable end state in an L2 (the near-native level)?; (iii) When the antecedent in object position is animate, do L1 NSL – L2 EP learners exhibit permanent optionality regarding the interpretation of overt subject pronouns but not of null subjects?

Considering the results from previous studies, we made the following predictions: for question (i), on the basis of Morgado et al. (2018), we predict an animacy effect in the interpretation of overt subject pronouns in L1 EP. For question (ii), based on the IH, we predict that near-natives, but not necessarily advanced and intermediate learners, will show sensitivity to antecedent animacy (if there is such an effect in L1 EP). For question (iii), based on the IH and previous studies (v. *supra*), we predict that L1 NSL – L2 EP learners will display permanent optionality only in the interpretation of overt subject pronouns. However, at least in some cases, optionality may only be captured by tasks that tap into processing, e.g. tasks with time pressure (cf. Sorace 2011).

The participants in the study were adult native speakers of EP, and upper intermediate, advanced and near-native L1 Italian adult learners of L2 EP. Proficiency in EP was assessed through the same type of screening procedure used by Sorace & Filiaci (2006). All participants were administered a timed and an untimed multiple selection task, in order to understand their preference regarding the interpretation of pronominal subjects in complex sentences with two possible antecedents in the main clause (in subject and object position) for

the embedded pronominal subject. The tasks had a 2x2 design crossing the following variables: (i) animacy of the matrix object (animate vs. inanimate) and (ii) type of pronominal embedded subject (overt vs. null) (cf. *appendix*). There were 24 items (6 per condition) and 24 fillers. Statistical analysis was conducted using linear mixed-effects models with crossed random effects for participants and items.

Preliminary results show no animacy effect in antecedent assignment in L1 EP (*contra* Morgado et al. 2018) ($p \geq 0.16058$ in both tasks). However, in the timed task, participants' reaction time in the condition overt pronoun + inanimate object was significantly higher than in the condition overt pronoun + animate object ($p = 0.0442$). Unlike L1 EP speakers, Italian learners of EP exhibit animacy effects in the resolution of overt subject pronouns ($p \leq 0.0018$ in both tasks). When the antecedent in object position is animate, learners from all proficiency groups display a preference for assigning the overt pronoun to that antecedent, in both timed and untimed tasks – hence, in this condition, Italian learners have no problems in the interpretation of overt pronouns (L1 EP vs. L2 EP groups: $p \geq 0.79457$ in both tasks) (*contra* the IH and consistent with Rothman, 2009). However, with inanimate object antecedents, learners tend to assign the overt pronoun to a non-object. A preliminary analysis revealed optionality in the resolution of null subjects, but only at an upper intermediate level.

Our results suggest that, unlike what has been claimed in recent work, animacy plays no role in antecedent assignment in L1 EP. Only the position of the antecedent seems to determine the division of labour between overt and null pronominal subjects, just as proposed by Carminati (2002) for Italian. Our findings also challenge the view that the interpretation of overt pronominal subjects is necessarily problematic for L2 learners. In L1 Italian – L2 EP, learners only exhibit permanent divergence when the overt subject is preceded by an inanimate object. Given the results of a corpus-based study which show that overt subject pronouns are almost always animate in EP (Barbosa et al., 2005), learners' difficulties (which are not predicted by the IH) may be due to the nature of the input to which they are exposed, which does not provide enough evidence for the possibility of overt subject pronouns retrieving inanimate antecedents.

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Appendix

Example of test item: Overt subject + animate object

O porteiro viu o professor quando ele caiu das escadas.
The doorman saw the teacher when he fell from the stairs.
_____ *caiu das escadas.*
_____ fell from the stairs.

[Note: in the timed task, the sentence was presented word by word at a rate of 450 ms per word, and the question appeared after the final word. Response time was recorded]

o porteiro, o professor, nem o porteiro nem o professor (options presented randomly)
the doorman, the teacher.M.SG, neither the doorman nor the teacher

	Null pronominal subject	Overt pronominal subject
Animate object	<i>O porteiro viu o professor quando [-] caiu das escadas.</i> The doorman saw the teacher when [-] fell from the stairs.	<i>O porteiro viu o professor quando ele caiu das escadas.</i> The doorman saw the teacher when he fell from the stairs.
Inanimate object	<i>O menino viu o brinquedo quando [-] caiu da cadeira.</i> The boy saw the toy when [-] fell from the chair.	<i>O menino viu o brinquedo quando ele caiu da cadeira.</i> The boy saw the toy when he/it fell from the chair.

Table 1. Sample test sentences per condition